

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION**

GENERAL KINEMATICS CORP.,)	
)	
)	
Plaintiff,)	
)	No. 08-C-1264
v.)	
)	HONORABLE DAVID H. COAR
CARRIER VIBRATING EQUIPMENT,)	
INC.,)	
)	
Defendant.)	

MEMORANDUM OPINION AND ORDER

Plaintiff General Kinematics Corporation (“GK”) filed suit against Defendant Carrier Vibrating Equipment, Inc. (“CVE”), seeking a declaration that U.S. Patent No. 5,615,763, entitled “Vibratory Conveyor System for Adjusting the Periodic Resultant Forces Supplied to a Conveyor” (“the ‘763 patent”) is invalid, and that GK’s VARIO-DRIVE™ conveyor/shakeout machine, which GK intends to make and sell in the United States, is non-infringing. CVE, meanwhile, has filed counterclaims for infringement and willful infringement, and it seeks both injunctive relief and an accounting.

The parties submitted briefs setting forth their respective constructions of disputed terms in claim 5 of the ‘763 patent, and on March 30, 2009, this Court held a hearing in accordance with *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996). On April 14, 2009, this court ordered the parties to submit simultaneously their post-*Markman* hearing briefs. Having considered the evidence adduced during the *Markman* hearing, along with the parties’ pre- and post-hearing submissions, the court sets forth below its construction of the disputed terms.

I. Legal Standard

Construction of patent claims is a question of law for the court. *See Markman*, 52 F.3d at 979-81. Claim construction is “the process of giving proper meaning to the claim language,” which “defines the scope of the protected invention.” *AbTox, Inc. v. Exitron Corp.*, 122 F.3d 1019, 1023 (Fed. Cir. 1997) (citation and quotation marks omitted).

The court begins this process with the language of the claim itself. *See Teleflex v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1324 (Fed. Cir. 2002). Generally a claim term carries its ordinary meaning, from the standpoint of a person of ordinary skill in the relevant art who has read the entire patent. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13, 1321 (Fed. Cir. 2005) (en banc). When that ordinary meaning is readily apparent, “claim construction involves little more than the application of the widely accepted meaning of commonly understood words.” *Id.* at 1314. But when understanding a claim requires examination of terms that have a particular meaning in a field of art, the court should use sources intrinsic to the patent to illuminate that meaning. *Id.* at 1314. Those sources include (1) the language in the term itself, including the context in which the term is used in both the disputed claim and in other claims; (2) the remainder of the specification; and (3) the prosecution history (if it is in evidence). *Id.* at 1314-17. When appropriate, the court also may use extrinsic evidence. *Id.* at 1318.

Other than the claim itself, the most important type of intrinsic evidence is the rest of the patent’s specification. *Id.* at 1315-16. The specification consists of “a written description of the invention, and of the manner and process of making and using it,” as well as a description of “the best mode contemplated by the inventor of carrying out [the] invention,” followed by “one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as [the] invention.” 35 U.S.C. § 112. It may reveal a “special definition” that

differs from the meaning a term otherwise would be given, or “an intentional disclaimer, or disavowal, of claim scope by the inventor.” *Phillips*, 415 F.3d at 1316. In such cases, “the inventor’s lexicography governs.” *Id.*

Next in importance is the prosecution history of the patent, which, if in evidence, will consist of the record of the PTO proceedings and any prior art cited during examination of the patent. *Id.* at 1317. Although it may lack the clarity of the specification, the prosecution history can provide evidence of how the PTO and the inventor understood the patent, and whether the patentee ascribed a special meaning to a term or intended to narrow its scope. *Id.*

If, after considering the intrinsic evidence, the meaning of a disputed term still is ambiguous, courts may consider extrinsic evidence. *Kopycake Enters., Inc. v. Lucks Co.*, 264 F.3d 1377, 1381 (Fed. Cir. 2001). Extrinsic evidence, however, is “less significant than the intrinsic record” for determining the meaning of patent claims. *Phillips*, 415 F.3d at 1317 (quotation omitted). Extrinsic evidence includes “all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” *Markman*, 52 F.3d at 980 (citation omitted).

Finally, under 35 U.S.C. § 112 ¶6, a special rule of claim construction applies to claim limitations written in a “means-plus-function” format. The rule applies “only to purely functional limitations that do not provide the structure that performs the recited function.” *Phillips*, 415 F.3d at 1311. To construct such functional limitations, the court first must identify the function and then identify in the written description the corresponding structure necessary to perform that function. *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999). In doing so, the court should focus on the ordinary meaning of the function. *Generation II Orthotics Inc. v. Medical Tech., Inc.*, 263 F.3d 1356, 1364-65 (Fed. Cir. 2001).

II. Construction of Claim 5 in the ‘763 Patent

The ‘763 patent, entitled “Vibratory Conveyor System For Adjusting The Periodic Resultant Forces Supplied To A Conveyor Trough,” was invented by Douglas A. Schieber, assigned to CVE, and issued on April 1, 1997. The parties’ dispute concerns only Claim 5 of the ‘763 patent.¹

To aid the court in gleaning the ordinary meaning of terms from the standpoint of a person of ordinary skill in the relevant art, CVE engaged Dr. Val DiEuliis, who provided testimony at the *Markman* hearing ostensibly from that perspective. Accordingly, before construing the disputed terms, the court considers whether DiEuliis is a person of ordinary skill in the art of the ‘763 patent. The parties agreed to define such a person as one “with [1] a bachelors degree in electrical or mechanical engineering and [2] one or more years of industrial experience [3] with knowledge of the design and/or use of vibratory conveyors or other industrial equipment with vibratory forces acting thereon, including [4] familiarity with control systems associated with them.” (*Markman* Hr’g Ex. O.)

At the *Markman* hearing, GK objected to DiEuliis’s qualification on two somewhat competing grounds: (1) he lacks experience with vibratory conveyor troughs, and (2) he is a person with *more than* ordinary skill in the relevant art. In its post-*Markman* brief, GK does not further explore these challenges.

The court concludes that DiEuliis is qualified to offer testimony from the standpoint of a person of ordinary skill in the relevant art. First, DiEuliis testified that he has a bachelors of science degree in electrical engineering from the University of Notre Dame—meeting the parties’ first requirement—along with a masters of science degree and a Ph.D, both in electrical

¹ Because in its complaint GK challenges the validity of claim 5, the parties also have stipulated to the construction of other terms in that claim; this opinion does not address those stipulated terms.

engineering, from the University of Illinois at Urbana-Champaign. (*Markman* Hr’g Tr. 16.)

Second, DiEuliis testified that he has multiple years of industrial experience in both the military and the private sector, thus meeting the second requirement. (*Id.* at 18-20.) Third, although he did not testify to specific prior knowledge of the design or use of vibratory conveyor troughs, DiEuliis did testify that he was familiar with systems creating vibratory forces, including optical disk drives. (*Id.* at 70.) Moreover, he testified that (1) he has designed electromechanical devices and control systems that involve oscillatory, and sometimes vibratory, motion; (2) he has designed and built a device that included sensors that monitored vibration in an avionics bay; and (3) he has developed requirements for a maintenance system that monitored and analyzed vibration signatures in large navy ship motors. (*Id.* at 18-20.) That is enough to establish both that he has “knowledge of the design and/or use of . . . industrial equipment with vibratory forces acting thereon,” and that he has “familiarity with control systems associated with them.”

The court rejects GK’s unexplained suggestion that DiEuliis is *overqualified*, presumably based on his years of experience and advanced degrees. There is no reason apparent in the record why DiEuliis’s education and experience would disable him from speaking to the understanding of a person of ordinary skill in the relevant art. *Cf. Monarch Knitting Mach. Corp. v. Sulzer Morat GmbH*, 139 F.3d 877, 884 (Fed. Cir. 1998) (rejecting unexplained assertion that expert’s title shows he possessed extraordinary skill in the art). It would, at most, affect only the weight the court gives to his testimony. Accordingly, the court concludes that DiEuliis meets the parties’ agreed definition of a person of ordinary skill in the relevant art, and that his testimony from that perspective may assist this court’s construction of claim 5, below.

A. The Language of Claim 5

This opinion addresses only the disputed terms and means-plus-function limitations in claim 5, which are underlined and in boldface type:

A vibratory conveying system for generating a sinusoidal vibratory motion in which a **resultant vibratory force** supplied to said conveyor trough is at a predetermined angle of attack to said conveyor trough resulting in nonparallel vibratory displacements of said conveyor trough with respect to a direction of conveyance,

said system maintaining or changing said **resultant vibratory force** during operation thereof

and comprising:

(a) a support base;

(b) a conveyor trough connected to said support base through vibratory elements;

(c) a first vibratory drive assembly including a first rotatable shaft, a first phase element connected to said first shaft, and a first motor for rotating said first shaft;

(d) a second vibratory drive assembly having a single second rotatable shaft connected to a second phase element, and a second motor for rotating said second shaft,

said first and second vibratory drive assemblies collectively providing a **resultant vibratory force** with said nonparallel displacements to said trough

as determined by a relative **phase angle** relationship between said first and second phase elements;

(e) detection sensor means associated with each of said first and second shafts for generating first and second signals when locating reference points on said first and second shafts;

(f) user input means for generating a predetermined **phase angle** representing a value of a **phase angle** relationship between said first and second phase elements required to provide said predetermined **resultant vibratory force** to said trough;

(g) a controller including

means in response to said first and second signals for generating a detected phase angle signal corresponding to real time phase angle existing between said first and second shafts,

comparison means for comparing said detected phase angle signal and said predetermined phase angle signal and generating a motor speed control signal proportional to the difference between said predetermined phase angle signal and said detected phase angle signal, and

motor speed control means responsive to said motor speed control signal, for altering the speed of at least one of said first and second motors until said detected phase angle and said predetermined phase angle signals are approximately the same value,

thereby providing a resultant vibratory force to said trough substantially the same as the predetermined resultant vibratory force.

(‘763 patent, col. 7 lin. 56-63—col. 8 lin. 1-45.)

B. Construction of Disputed Terms

1. “resultant vibratory force”

GK contends that the term “resultant vibratory force” should be construed to mean “force having direction and magnitude.”² CVE responds that the term should be construed to mean “vector force in three dimensional space resulting from one or more forces that is applied to a vibratory trough of a conveyor.”³

The court adopts CVE’s construction. First, GK’s construction, which is not offered as the “ordinary meaning” given to this term, reads out the word “resultant” and does not account adequately for the word “vibratory.” (R.56, Ex. A, DeEuilius Reb. Decl. ¶6.) *See Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1119 (Fed. Cir. 2004) (“all claim

² For this and other terms, GK initially proposed a different construction, but abandoned it in later submissions to the court. The court will not address these forfeited constructions.

³ Both GK and CVE provide these same definitions for this term in the context of the phrase “said system maintaining or changing said resultant vibratory force during operation thereof,” and both maintain that the other words of that phrase should be given their ordinary meaning. Accordingly, there is no need to construe separately the term in the context of that phrase.

terms are presumed to have meaning in a claim.”) Rather, as DiEuliis testified, a person of ordinary skill in the art would understand GK’s proposed language—“force having direction and magnitude”—to define a vector force, and nothing more. (R.67, Ex. 2, *Markman* Tr. 32.) CVE’s construction, on the other hand, accounts for those direction and magnitude components by using the term “vector force,” while also giving meaning to the words “resultant” and “vibratory.” See *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) (“A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.”) And its inclusion of the object upon which the force acts—the vibratory trough of a conveyor—is consistent with claim 5 itself, which recites that the “resultant vibratory force [is] supplied to said conveyor trough.” (‘763 patent col. 7 lin. 57-58.) Indeed, even the portion of the specification that GK cites to support its definition refers to “the resultant force acting on the conveyor.” (‘763 patent col. 3 lin. 67-col.4 lin 2.) Finally, DiEuliis’s testimony, which is entitled to some weight, supports CVE’s construction based on how a person of ordinary skill in the art would understand the term.

At the *Markman* hearing, GK’s only challenge to CVE’s construction was its use of the phrase “in three dimensional space.” (*Markman* Tr. 46-51.) Relying on the drawings in the specification, GK contended that the forces acted only in two dimensions. But DiEuliis clarified that in an actual machine some residual forces would apply to the trough in all three dimensions, (*id.* at 69), and GK does not challenge that contention in its post-hearing brief. Accordingly, because CVE’s construction is derived from and consistent with the claim language and the specification, and because it reflects DiEuliis’s understanding of the term, the court adopts CVE’s construction.

2. “phase angle”

GK contends that the term “phase angle” means “the arc of rotation of one of the shafts from when its reference point is detected until the reference point on the other shaft is detected.” CVE responds that the term means “an angular position of a phase element on a rotating shaft with respect to a reference plane.”

Again, the court adopts CVE’s proposed construction. First, the phrase “arc of rotation” in GK’s construction is not in the claim or the specification, and the court will not read it into this term. *See Amgen, Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1326 (Fed. Cir. 2003). Second, in referring only to “one of the shafts” and “the other shaft,” GK’s definition erroneously implies that there are only two shafts; but Figure 1 of the patent illustrates a preferred embodiment showing three shafts, with “Angle A” associated with two shafts that rotate in one direction, and “Angle B” associated with a third shaft that rotates in the opposite direction. (‘763 patent, Fig. 1 & col. 3 lin. 55-56.) That embodiment is consistent with claim 5’s language that the first vibratory drive assembly “includ[es] a first rotatable shaft” (without excluding the possibility of additional rotatable shafts), while the second vibratory drive assembly explicitly “ha[s] a *single* second rotatable shaft.” (‘763 patent, col. 8 lin. 4-8) (emphasis added). Third, GK’s construction is inconsistent with the specification’s explanation of how a phase angle is measured: referring to Figure 1, for example, the specification explains that angle A is “measured *between an outwardly directed radial line* from the center of the respective rotating shafts through the midpoint of the weights (or some other selected reference point on the shaft) *and a data plane*” and that the weight on the third shaft “will have an angle B similarly measured.” (‘763 patent col. 4, lin. 5-9) (emphasis added).⁴ But GK’s construction accounts neither for the radial line nor the data plane

⁴ GK contends that these angles are not “phase angles” because, in its view of Figure 1, they “inherently vary continuously during rotation of the shafts.” (R.68, GK Post-Markman Br. 4.)

and instead implies that a phase angle inherently depends on the relationship between two shafts. That limitation is not supported by the specification and is inconsistent with DiEuliis's understanding. (R.67, Ex. 2, *Markman* Tr. 30.) Fourth, GK's contention that its construction is consistent with Figure 5 is unpersuasive; although that drawing shows proximity switches detecting a "flag" or reference point on each of the shafts, it does not suggest that the process of detection is inherent to the phase angle itself. ('763 patent, Fig. 5.)

In contrast, CVE's proposed construction uses the words "angular position . . . with respect to a reference plane," which better captures the specification's notion of an angle measured "between . . . [a] radial line . . . and a data plane." In defining the term "phase angle" with reference to a "phase element," moreover, CVE's construction appropriately draws a connection implicit in the use of the modifier "phase" in each of the terms. And that the angular position is "of a phase element on a rotating shaft" also is consistent with the specification: in Figure 1 the radial line extends outward from the center of the shaft through a weight on the shaft, known as a "phase element," which operates as a "reference point" for measuring the angle. ('763 patent Fig. 1.) Finally, CVE's proposed construction is consistent with DiEuliis's understanding of this term.

In its post-*Markman* brief, GK relies on the description of the '763 patent invention contained in U.S. Patent No. 6,024,210 ('210 patent) to contend that CVE's proposed construction, which allows for the phase angle to change during operation of the machine, is contradictory. Specifically, it cites the following language in the '210 patent:

Although the court does not dispute that, as understood in Figure 1, angles A and B may vary during rotation of the shafts, the court finds no language in claim 5 requiring that a phase angle remain constant. Moreover, the court disagrees with GK's contention that, because the portion of the specification discussing angles A and B deals with the resultant force acting on the conveyor, angles A and B could not be phase angles; the resultant force, as explained in this same section, depends upon the relative values of angles A and B. ('763 patent col. 4 lins. 12-35.)

The invention in the aforementioned Patent [‘763 patent] addresses the problem of maintaining a predetermined phase angle for providing the desired angle of attack throughout an operating cycle of the conveyor through use of a control system.

(‘210 patent at col. 1, lin. 31-35.) This extrinsic description implies that a single predetermined phase angle could be maintained throughout an operating cycle of the ‘763 invention. But claim 5, which controls the court’s analysis, explains that the resultant vibratory force is “determined by a *relative* phase angle *relationship* between [the] first and second phase elements” (emphasis added), which strongly implies that there is a phase angle associated with each phase element. Moreover, the specification in the ‘763 patent further explains that, “[b]y varying the relative positioning or *relative* phase angle between the shafts, the direction or angle of attack of the resultant forces can be changed” (‘763 patent at col. 4, lin. 30-33.) This language supports CVE’s construction, which defines “phase angle” based on the positioning of a phase element with respect to a data plane, thereby allowing for the “relative positioning” of phase elements on different shafts, along with a “relative phase angle relationship,” as contemplated by claim 5 and the rest of the specification. GK’s construction, on the other hand, would read out the words “relative” and “relationship” from the claim. Accordingly, the court adopts CVE’s construction.

3. “detected phase angle signal”

GK contends that the phrase “detected phase angle signal” means “representation of the actually occurring phase angle between the shafts.” CVE responds that it means “the representation corresponding to the relationship between the phase angles present on different rotating shafts.”

Initially, GK’s construction seems apt: it comports with language in the claim that a “detected phase angle signal correspond[s] to real time phase angle existing between said first and second shafts.” But other language in claim 5 strongly implies that the phase angle signal reflects

the *relationship* of phase angles on different shafts. First, elsewhere in claim 5 the “predetermined phase angle signal” is said to represent “a value of a phase angle relationship between said first and second phase elements.” (‘763 patent col. 8, lin 21-24.) Second, claim 5 explains that the resultant vibratory force is determined by that “relative phase angle relationship,” and that it can be substantially the same as the predetermined vibratory force if the “detected” and “predetermined” phase angle signals are approximately the same value. In other words, each phase angle signal corresponds to a relative phase angle relationship.

The specification also supports CVE’s construction. The portion of the specification upon which GK relies explicitly says that the controller receives the “position information” of the rotating shafts and then “generates a real phase angle signal corresponding to the phase angle *difference* of the shafts.” (‘763 patent col. 4 lin. 46-50) (emphasis added). Although the difference between two angles is an angle itself, GK’s construction unhelpfully suggests that the signal corresponds to a *shared* angle, rather than a *comparison* of angles. The court agrees with DiEuliis that CVE’s construction captures this nuance, while GK’s does not. CVE’s construction therefore comports best with the language of claim 5, the rest of the specification, and, again, DiEuliis’s testimony. Accordingly, the court adopts CVE’s construction.

C. Construction of Disputed Means-Plus-Function Limitations

1. “means in response to said first and second signals for generating a detected phase angle signal corresponding to real time phase angle existing between said first and second shafts”

The parties agree that this is a means-plus-function limitation governed by 35 U.S.C. § 112 ¶ 6. GK contends that the phrase refers to “a logic which continuously compares the first and second shaft position signals during operation and produces a real phase angle signal representing the actually occurring phase angle difference between the shafts.” CVE responds

that the phrase should be given its plain and ordinary meaning, with the exception of the terms already construed. CVE identifies the function as “generating a detected phase angle signal” and the corresponding structure as “controller 46 as exemplified in supporting text and accompanying Figures, and equivalents thereof.”

As an initial matter, GK’s construction of this and other means-plus-function limitations does not define separately the function and corresponding structure, rendering it unhelpful for the court’s analysis under *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999). In any event, the court agrees with CVE that the function here is “generating a detected phase angle signal,” or, employing the construction above, “generating a representation corresponding to the relationship between the phase angles present on different rotating shafts.” Based on GK’s construction, the function would entail “continuously” producing that representation—but nothing in the claim commends that limitation. Although in describing the preferred embodiment the specification says position information “is continuously provided by signals to a controller which in response . . . generates a real phase angle signal corresponding to the phase angle difference of the shafts,” that “continuousness” refers only to the provision of position information, and not necessarily to the generation of a real phase angle signal. (‘763 patent col. 4 lins. 46-50.) Meanwhile, CVE’s cited function incorporates the court’s construction of “detected phase angle signal” but otherwise allows the words to carry their ordinary meaning, without importing any limitation.

As for the corresponding structure, GK suggests that it is the “logic,” and it argues in its post-*Markman* submission that it would be illogical to read this phrase in context as “a controller including . . . controller 46 as exemplified in supporting text and accompanying Figures, and equivalents thereof.” The court disagrees. The introductory word “controller” can be read to

refer to a generic controller, with “controller 46” referring to a more specific structure. Not only is such a reading “logical,” it also comports best with the specification. The specification recites that, in Figure 5, “[c]ontroller 46 receives a multiple of signal inputs . . . directed toward the logic 50,” and that the “output” of logic 50 is “a value representing the real time phase angle difference.” (‘763 patent col. 5 lin. 10-18.) Generation of the signal, then, requires both the reception of input and the production of output. Accordingly, the broader structure of the controller, of which the logic is a part, more appropriately characterizes the corresponding structure for this function.

2. “comparison means for comparing said detected phase angle signal and said predetermined phase angle signal and generating a motor speed control signal proportional to the difference between said predetermined phase angle signal and said detected phase angle signal”

As an initial matter, the parties have stipulated that the term “predetermined phase angle signal” means “representation of a user selected phase angle.” GK contends that the full phrase means “a comparison routine which compares the value of the actually occurring phase angle signal to a user-selected phase angle signal and, if the values are not the same, produces a motor speed control signal according to the difference between the actually occurring phase angle signal and the user-selected phase angle signal.” CVE responds that the phrase should be given its plain and ordinary meaning, with the exception of the terms already construed. CVE identifies two functions here: (1) “comparing said detected phase angle signal and said predetermined phase angle signal,” and (2) “generating a motor speed control signal.” And CVE identifies the corresponding structure as “controller 46 as exemplified in supporting text and accompanying Figures, and equivalents thereof.”

Again, in failing to define separately the functions and corresponding structure, GK's construction does not fully assist the court's analysis. GK's construction also incorporates constructions of the terms "phase angle" and "detected phase angle signal" that this court has rejected. In contrast, the functions CVE has identified are restricted to the language used in this limitation, and are supported by DiEuliis's testimony as a person of ordinary skill in the art.

GK appears to contend that the corresponding structure is a "comparison routine." Although there is language in the patent suggesting that the first function is achieved by a comparison routine, there is nothing to support the notion that the comparison routine also "generat[es] a motor control signal." Again, the two functions more accurately correspond with the broader structure of the controller, of which the comparison routine is a part. ('763 patent col. 5 lin. 22-30 and Figure 5.) This, too, comports with DiEuliis's testimony that the corresponding structure is controller 46 or its equivalents. Accordingly, the court adopts CVE's constructions of the functions and corresponding structure.

3. "motor speed control means responsive to said motor speed control signal, for altering the speed of at least one of said first and second motors until said detected phase angle signal and said predetermined phase angle signal are approximately the same value"

GK contends that this should be construed to mean "a variable frequency drive which continuously adjusts the speed of at least one of the first and second motors based upon the motor speed control signal until the actually occurring phase angle is approximately the same as the predetermined user-inputted phase angle." CVE responds that the phrase should be given its plain and ordinary meaning, with the exception of the terms already construed. And CVE identifies the "function" as "altering the speed of at least one motor," with such terms given their ordinary

meaning, and its corresponding structure as “Variable Frequency Drive, shown in the ‘763 Patent as Ref. 48 as exemplified in accompanying text, and equivalents thereof.”

GK’s construction suffers much of the same infirmities as in the previous means-plus-function limitation: it does not identify a function and a corresponding structure, and it incorporates a construction of the term “detected phase angle signal” that this court already as rejected. Moreover, although there is some support in the specification for the notion that the variable frequency drive in Figure 5 “continuously” adjusts the speed of a motor, it would be improper to import that limitation into the means-plus-function limitation here, where the plain and ordinary language of the claim itself does not support it. (*Compare* ‘763 patent col. 4 lin. 57-60 *with* col. 8 lin. 38-45.) CVE’s construction, on the other hand, reflects the plain and ordinary meaning one would ascribe to this phrase, restricts itself to the claim’s language, and comports with DiEuliis’s reading. And because the parties agree that the corresponding structure is the variable frequency drive, the court does as well. The court adopts CVE’s language to describe that structure, however, as it incorporates the notion of equivalents. *See* 35 U.S.C. § 112 ¶6.

III. Conclusion

For the foregoing reasons, the court construes the disputed terms and phrases in claim 5 of the ‘763 patent as follows:

The term “resultant vibratory force” means “vector force in three dimensional space resulting from one or more forces that is applied to a vibratory trough of a conveyor”;

The term “phase angle” means “an angular position of a phase element on a rotating shaft with respect to a reference plane”;

The term “detected phase angle signal” means “representation corresponding to the relationship between the phase angles present on different rotating shafts.”

The court construes the disputed means-plus-function limitations as follows:

“[M]eans in response to said first and second signals for generating a detected phase angle signal corresponding to real time phase angle existing between said first and second shafts” is a means-plus-function limitation in which the function is “generating a detected phase angle signal” and the corresponding structure is “controller 46 as exemplified in supporting text and accompanying Figures, and equivalents thereof.”

“[C]omparison means for comparing said detected phase angle signal and said predetermined phase angle signal and generating a motor speed control signal proportional to the difference between said predetermined phase angle signal and said detected phase angle signal” is a means-plus-function limitation in which the functions are (1) “comparing said detected phase angle signal and said predetermined phase angle signal,” and (2) “generating a motor speed control signal,” and the corresponding structure is “controller 46 as exemplified in supporting text and accompanying Figures, and equivalents thereof.”

“[M]otor speed control means responsive to said motor speed control signal, for altering the speed of at least one of said first and second motors until said detected phase angle signal and said predetermined phase angle signal are approximately the same value” is a means-plus function limitation in which the function is “altering the speed of at least one motor,” and the corresponding structure is “Variable Frequency Drive, shown in the ‘763 Patent as Ref. 48 as exemplified in accompanying text, and equivalents thereof.”

It is so ordered.

Enter:

/s/ David H. Coar

David H. Coar
United States District Judge

Dated: **July 27, 2009**